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THE PAST—THE PRESENT—FOR THE FUTURE.

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tance and magnitude, some, and perhaps the greatest number, hold a course parallel to the mountains, as the Shenandoah, the Conogocheague, the Lehigh, &c. draining the vallies, and receiving away the torrents of the mountains.

The third order of our water courses rise either in the lowest ridge of our hills, which I will call the granite ridge, and over which all our principal rivers, from Georgia to the Hudson, fall, and then run through the alluvial country which lies between the granite ridge and the ocean. Such rivers are, the Nottoway, the Blackwater, the Meherrin, the Annacosta, (eastern branch of Potomac) the Elk river, and the very important creek in the state of Delaware, the Christiana; or they are merely drains of the alluvial country, assuming an appearance of importance below the head of the tide, above which they are mere torrents, almost dry in the autumn. Such streams are all the rivers of the eastern shore of the Chesapeake, and of the lower part of the Jerseys, and innumerable water courses, forming large estuaries in the southern states.

Our great north western lakes, from their first source to the eastern end of lake Erie, may be considered as part of the great river St. Lawrence, following the direction of the rest of our rivers, until opposed by the northern extremity of the Alleghany. From thence its course follows the valley west of the Alleghany, through lake Ontario to the ocean, receiving the waters of the northern extremity of the mountain in its course.

This general view of the construction of our country was necessary in order to understand the general principles on which our artificial navigation can be so conducted, as to be useful, or even practicable; and to explain why connections of waters, which on the map appear advantageous and feasible, would be useless, and perhaps impracticable, by any effort of art.

Two principal objects will dictate all the exertions towards the improvement of our internal navigation, which can, for many years to come, be attempted: 1. To carry our produce by water to the nearest port for its exportation, and the importation of foreign articles: 2. To exchange by internal commerce the articles reciprocally deficient on lines parallel to the sea coast. Canals, the use of which arises from manufacturing activity, will not probably be soon required.

The first object,—as all our principal rivers run seaward, and generally by the shortest course,—must be attained by the natural or improved navigation of the rivers themselves, or by canals cut parallel to them: the second may often require a navigation parallel to the vallies, so as to communicate one principal river with another.

The former attempt at improved navigation has already been made on many of our principal rivers, —the latter has been seldomer undertaken; and only once above the falls of both primary rivers, in the canal intended to join the Susquehannah and Schuylkill, and the Schuylkill and Delaware rivers above Philadelphia.

The general construction of our country opposes to artificial navigation, in either of these directions, difficulties, which in no part of the world exist in so uniform, and certain a degree. Canals,

parallel to our rivers, have three formidable obstacles to encounter and overcome.

1. The rapid descent of the ravine cut through the mountains by the river itself, along which the canal must be carried;—or, if the ravine be quitted, difficulties on the high levels, which, the further you go from the river, are always intersected by the more numerous ravines; and embarrassed by the difficulty of returning to the ravine of the river.

2. The invariably rocky nature of the ground, which is uniformly of granite in all its varieties; and has numerous fissures which carry off the water, and require lining.

3. The difficulty of keeping off the land water, and of crossing the lateral branches and torrents of the river.

On the other hand, canals parallel to our mountains must necessarily cross the ridge or spur of the mountain which divides the waters of two primary rivers. On this ridge, above the falls, the water requisite to supply the canal, is always scanty, often there is none: and though a tunnel, or a stream engine, or in the last resort, a rail road, are certain means of obviating the difficulty, they are expensive, inconvenient and imperfect. Below the granite ridge, the difficulty is less. There may always be found a supply of water from the ridge itself; and the feeders, though carried through rocky and expensive ground, are themselves useful, as small canals, as far as they extend; and below the ridge the soil is easily cut and embanked.

Having so frequently mentioned the granite ridge, I will here trace its extent as far as my knowledge of our country enables me to do it.

The granite ridge forms the shore of the north side of Long island, opposite to the island of New York. All the south of the island is alluvial, and is the first margin of alluvial soil below the granite ridge. This margin of alluvial soil, beginning at Long island, widens as it extends to the south west, until in Georgia it becomes more than 200 miles in width.

Staten island and Bergen point, are two spurs of this same ridge, which continues nearly in the line of the post road to Trenton, where the river Delaware falls over it, having worn down the rocks more deeply there than many other of our rivers. The Delaware runs, in its general direction, for 60 miles under the ridge as far as New Castle, leaving it only for a short distance at particular bends of the river. At Philadelphia the ridge crosses the peninsula to Gray's ferry on Schuylkill. The softer granite of Schuylkill has been worn down so, that the falls are 4 miles from its lower edge. From Philadelphia the ridge runs with the post road to Havre de Grace, where it is visible on both shores, although the tide extends 6 miles above, to the foot of the falls.

The Susquehannah, by the name of the Chesapeake, may be considered as running under the foot of the granite ridge almost as far as Baltimore, which city is built upon the foot of the ridge. At the river Patuxent, on the post road, the ridge appears again, but is lost under the incumbent soil, and is not again visible until it appears at Georgetown. The harder granite of the Potomac has re

sisted the force of the water more than the granite further to the north-east, and the tide reaches only 3 miles above its outrunnings. From the Potomac, the falls of Rappahannoc at Fredericksburgh, of James river at Richmond, Appomatox at Petersburg, Roanoke at Halifax, beyond which point my personal observation does not extend, point out the course of this ridge in a line nearly parallel to the Blue ridge, diverging to the eastward as it extends southward.

Of the improvement of the natural navigation of our rivers leading to the sea, and of canals cut parallel to them.

The difficulties of the natural navigation of our rivers are: In spring,—the danger of wreck in the wild water of our rapids; in autumn,—obstructions created by rocky shoals; and, in most of them, rapids and falls impracticable at all times. The least expensive and most obvious means of removing the former, are the blowing of the most prominent rocks, so as to straighten the channel, and procure a passage at low water. This has, in almost all our rivers, been attempted on a greater or less scale, and with various degrees of success. When injudiciously performed, and in rivers of rapid descent, and liable to great variation in the quantity of their water, more injury has been done than advantage obtained. Many of our worst obstructions act as natural dams; which, holding up the water, create a large extent of excellent navigation above them. Of this the James river, above Westham, and the Susquehannah, above Chickisalunga and Hunter's falls, are instances in point. Such obstructions, when removed, let down the water rapidly from above, without supplying deeper navigation below.

In a river of such magnitude as the Susquehannah, indeed, no gap or sluice artificially cut, can materially affect the rapidity of the stream; but in lesser rivers, great care is required, not only to prevent lowering the water above, but to avoid giving a new direction to the current, more mischievous in its effects than that which has been changed. But with whatever judgment the natural navigation of a river, perplexed by rapids and shoals, may be conducted, and however its descent may be thereby facilitated, its ascent cannot possibly be rendered more easy, in the same degree. Thus, for instance, although by the monies expended by the state of Pennsylvania and the Susquehannah canal company, on the natural navigation of the Susquehannah below Wright's ferry, it has been rendered much less dangerous to run down the distance of 41 miles, almost the whole of which is a tremendous rapid, from Columbia to the tide, and thereby to carry lumber, iron, and agricultural produce to Havre de Grace, and thence to Baltimore,—yet so difficult is the up-stream navigation by the same route, even with the assistance of the Susquehannah canal, that the returns, in imported articles, have been generally purchased in Philadelphia and conveyed to Columbia, or Middletown, above the rapids, by the Lancaster turnpike, thence to be boated to the country watered by the upper branches of the Susquehannah. And, although the Philadelphia market has hitherto offered more advantages to the buyers of imported goods than that of Baltimore, yet the expense of transporting them 72 miles by land to Columbia, would, if there were a good navigation from Havre de Grace upwards, destroy this advantage.

The difficulty of carrying canals parallel to our great rivers, the scarcity of engineers possessing knowledge and integrity, the want of capital, and above all, the erroneous dread of bold measures, and the fear of uselessly expending money in works hitherto unknown among us, has deterred those, interested in improving our navigation, from deserting the beds of our rivers, while it was practicable to keep them. They have therefore had recourse to canals only where navigation was otherwise impossible; where obstructed by rocks, or broken by a cascade.

There cannot however be a reasonable doubt that if in England, where, compared with the United States, the quantity of water in the rivers varies little between the driest and the wettest period of the year, a canal, running parallel to a river, furnishes a much more certain and safe and equal and cheap navigation than the river itself—it is infinitely more the case here. Unfortunately those of our canals which have been cut to pass the rapids and falls of our rivers, partake in a great measure of the inconveniences of the rivers themselves; some wanting water when the river is low, some incapable of being entered excepting at a particular height of the water in the river, some subject to constant accumulation of bars, and all of those with which I am acquainted, much less useful than the money expended on them ought to have made them.

Those canals, of which I now particularly speak, are, the James river canal, the Potomac canal, the Conewago, and Susquehannah canals. Of the canals north of the Delaware, and south of Virginia, I have not sufficient knowledge, nor can I speak of the Appomattox canal. It is, I believe, not liable to the same strictures in all points, which I shall make upon the others, but though I am well acquainted with the ground, I have not seen the manner in which the work has been executed.

One great and fatal error has been interwoven into the scheme of the other canals, excepting only that of the Potomac: They have been dug as much with a view to the erection of mills, as to the purposes of navigation. To fit them for mill-races, their descent is rapid, and their current strong. They are liable, of course, to the variation of the quantity of water in the river; they bring down with their current, the alluvium of the river; bars are formed in them, as well by this alluvium, as by the land wash; and their banks, where they are not of rock, or walled, are liable to perpetual wear by the currrent. The canal is, besides, itself, an inconvenient rapid to those who would ascend it.

Besides these inconveniences, the contracts binding the company to furnish to the millers the water, when it rises above a certain gage-selle, for an annual rent, or on other fixed and permanent terms, tie the canal company to the original construction of the work, and forbid future improvement. For instance, if a lock were found to be useful above the highest mill, it could not be erected, because it would rob the mills below of their stipulated water; the inclination of the canal cannot be lessened, because it would have the same effect. In the James river canal, more than in any other which I have seen, this error, though now generally considered as a very great advantage, will at some future period be discovered and deplored. The Potomac canal, more especially that of the Little falls, has the same defect of a too rapid descent, although the object of a mill race is placed by their charter out of view. But its principal defect is of another kind, to which that of James river is also, but in a less degree, subject. It receives the wash of all the hills and ravines of

the north bank, which ought to be discharged through culverts, or carried over bridges: and that legislative impartiality which has required the canal to enter the river at the very head of the tide, in order that Virginia may have an equal chance of becoming the depot of its commerce with Maryland, has very much injured its utility to the country at large.

In a still greater degree than the Potomac canal, the Susquehannah canal, beginning at the Maryland and Pennsylvania line, and ending at the head of the tide, has the defect, not only of receiving the landwash of the hills and ravines, but also two considerable rivers, the Conewingo and Octorara; partaking, thus, of all the danger arising from their inundations, and receiving their alluvium. This canal is also applied to the purposes of a mill race. Other inconveniences attend it, which arise from the most unfriendly nature of the river, and the local feelings of the state legislatures of Pennsylvania and Maryland, at the period of the incorporation of the company.

The Conewago canal, about 50 miles higher up the Susquehannah, is also a mill race, and is the property of an individual. It is of difficult entrance, which is to be regretted, as it ought to be the means of passing a short, but very dangerous fall of the river, which interrupts a long extent of very good navigation.

Having thus pointed out the general and common defects of these canals, to which I may add the general want of proper slopes to their banks, I will now enter upon the very thankless task of giving an honest opinion, respecting them in detail, viewing only the *public interests*, and perfectly conscious of the bearing, of what I shall say, upon private feelings. These feelings, however, are extremely short-sighted; for nothing could be more advantageous to the individuals most interested, than those measures which would most benefit the public.

The James river and Appomattox canals, stop short of tide water. The most important of these canals is that of James river. Upon the coal mines of James river our Atlantic sea ports will soon become dependent for their chief supply of fuel. That dependence exists already in respect to the fuel required for a variety of manufactures, and even now, the smiths, within 10 miles of our sea ports, require, in order to carry on advantageous business, a supply of Virginian coal. There are three means (and I think only three) by which the Virginian coal can be brought to the tide:—1. By a small canal, and rail roads, immediately from the mines south of the river, to the shipping tide water at Ampthill, or its neighborhood, along the valley of Falls creek—distance, I believe, 20 miles. This is a route easily practicable, and at a moderate expense, for Falls creek rises in the coal mines themselves. 2. By the turnpike road to Manchester opposite Richmond. This road has been sometime completed, and is of the highest utility. 3. By James river, to the head of the falls, and thence by the canal to Richmond. This is, for two-thirds of the coal country, the best and most obvious route. From all the mines the coal may easily be brought to the river on rail roads, and thence boated, independently of the cheaper conveyance which Tuckahoe creek might be made to yield to a great extent of coal land now little worked. But of what adequate use is the navigation in boats carrying, at an average, 200 bushels of coal only. when, if the canal were well constructed, 1000 bushels might be be as easily and cheaply conveyed; and when, on their arrival at Richmond, they must be unloaded, again loaded into carts and carried down by a bad road to the tide at Rockets, to be shipped? The Manchester turnpike, with all its expense of waggons, horses and drivers, and the consequent waste of *labor*, *capital*, *food* and *forage*, is a better, and, I am told, as cheap a mode of conveyance.

The means by which the canal itself may be made much more useful, I will not consume your time and patience in detailing; what is most important, taking the whole subject into view, is to connect the canal, such as it is, with the tide.

In the year 1796, Mr. Weston, then engineer to the western navigation companies of the state of New-York, was called to Richmond, to give his advice and opinion on this subject. It amounted to this: to connect the basin with the foot of the falls, by a succession of ten or eleven locks in one tier, carrying the race of Ross's mill, upon an aqueduct, across the canal at the foot of the locks. With all deference to his talents, I cannot help remarking, that of all expensive projects of which I ever heard, this would have been one of the most useless. For, independently of the excessive inconvenience and detention which such a tier of locks, at the most busy part of the navigation, would occasion, the boats would arrive at their foot, in a very considerable rapid, now impracticable, and which could only be made practicable by blowing up the rocky bed of the river. When arrived there, two miles of tide water must be encountered; to navigate which, these boats are wholly unfit. I cannot help thinking that the present mode of conveying the coal to Rockets is not much less eligible. I refrain from stating many other objections, which are professional, and which, I believe, were, as well as those already mentioned, as evident to Mr. Weston as to myself; but objections of another nature, more powerful than mere physical difficulties, opposed every project excepting that which he proposed.

In order to connect the basin of the James river canal with the tide, a very simple means is offered by the nature of the ground. To do this it will be necessary to form a capacious basin at Rockets, communicating with the tide by one or more locks. To carry a canal from thence along the level bank of James river to Shockoe creek. A cheap aqueduct, of one arch, of 30 feet span, will carry the work across the creek into the back street. The canal will then go up the back street, mounting, by successive locks, not more than two in each tier, into the basin. The canal from Rockets to the basin, on Shockoe hill, should be of nine feet draft of water, and the locks 100 feet long and 18 feet wide. This canal would, of course, bring vessels which navigate our coasts and bays, and run out to the West-India islands, into the basin on Shockoe hill.

The legislature of the state of Virginia, (for the commonwealth is deeply interested in the stock) has, from time to time, expressed great anxiety on the subject of completing this canal. But the dread of unforeseen difficulties and risks in carrying the work below the basin, and the value and productiveness of the stock in its present state, have hitherto overbalanced this anxiety. But, considering Richmond as the principal source of fuel to the cities on our sea coast, at least until the mines of cape Breton shall supply us, I feel a national sentiment in deeply regretting the very fatal policy which maintains and supports the error, and the mutilation of this most important work. I will not, at the same time, deny, that when it is considered that those who projected and executed the canal were men of no acquaintance either with general

clay are found in abundance for all purposes of puddling.

The advantage of so level and soft a surface for the cut is counterbalanced by the total absence of water to supply it. This circumstance is very important in determining the choice of the line of the canal, among so many that are equally practicable; for as all its water must be brought from the higher grounds upon the ridge, its location ought to be as near to the ridge as possible, in order that, the feeder being short, the leakage and evaporation of a long feeder may be avoided. The location of the two ends of the canal does not, however, entirely depend upon its general course along the summit; and a great variety of terminations have been proposed, as equally eligible both to the Chesapeake and Delaware side. The former, after long and careful exmination, has been decided in favor of Welch point, where there has, within the memory of man, been no diminution in the depth of the water, which is below the deposite of alluvium from Elk creek, and were the water is so wide and so deep, as to form a very capacious basin for many years to come, for the inconsiderable land wash of Back creek and the small drains in the neighborhood. But, on the Delaware side, much difference of opinion has prevailed. The summit level of the canal in every case must reach the principal road leading from Christiana bridge down the peninsula, near a tavern called the Bear. This place is only two miles distant from Hamburg or Red hook, on the bay of Newcastle, and a cheap and short cut might be made to either of these points, especially to Red hook, did not two considerations forbid it—the broad and wild water of the bay, and its shallowness at a great distance from the shore, there being only four feet six inches at low water. Newcastle is the next eligible point. Newcastle is situated on a prominent point, which is swept both by the flood and the ebb tide. There will therefore be always deep water at the *outer* wharves and piers at that place, and less than 21 feet has not been found on the outside of any of the piers lately erected; or formerly, and even at present, at the wharves, excepting only where the eddy occasioned by the piers has accumulated soft banks of mud.

There could not be a moment's hesitation in fixing the termination of the canal at Newcastle, unless the following reasons should be thought to outweigh the advantages of the best water in the Delaware, and the shortest navigation across the peninsula, which this point offers. It is in the first place feared, that in time of war, when the canal would be invaluable as a means of conveyance of military stores and bodies of men, an enemy's ship of war might destroy the works at Newcastle in a sudden incursion, and return to sea, before the mischief could be prevented. It is further urged, that the mouth of the canal on the river below the tide would be liable to be filled up, in a very short time, as are all places on the Delaware where there is an eddy. And it is also alleged, that Newcastle is situated so far below Philadelphia (33 miles) that, unless with a favorable wind, dull sailing vessels cannot reach Newcastle in one tide, when they might reach the mouth of Christiana, four miles higher up the river, and go up the creek with the flood.

The first argument, appears to me to be deserving of consideration in a national point of view, and a small fort would be necesary to defend the mouth of the works against an enemy who should attempt to land to blow them up. But they could not be injured, even by shells, beyond the destruction of the gates, which a few hours could put again into repair. To obviate the second objection it would be necessary to place the tide lock as far out as possible, and to carry out and wharf the side of the canal below the lock as far into the river, as the most projected wharf. The line of the wharves is now limited to 600 feet beyond the lowest street, called Water street, and unless further protruded into the river by a law of the state, this distance presents no formidable difficulty to the work, and places the utmost extention of the wharves beyond the present time. The third objection is not without foundation. But the narrow and crooked navigation of Christiana creek, presents infinitely more causes of delay than the distance of four miles in the bold navigation of the Delaware.—There is, however, in these objections enough to render it an object of infinite importance both to the nation and to the company, to avail themselves of both the eastern terminations of the canal, and to make a cut also from the Bear to the Christiana creek, about three miles above Wilmington, on a line not altogether so favorable, nor so short as that to Newcastle, but presenting no difficulties of importance whatsoever. From the point (Mendenhall's) at which the termination is proposed, 10 feet may be carried out to the river Delaware.—The objections to this termination are: the tedious and very crooked navigation of the creek for seven miles to the Delaware. The drawbridge at Wilmington, which must be passed; but more than any other, the opposition of the tides of Delaware and Christiana creek. For if a boat comes into the canal at Welch point at high water, and passes across in six hours, she will find half flood in Christiana, and must wait the ebb to go down. On her arrival in the Delaware, in two and a half or three hours, she will have again to wait three or four hours for the flood to proceed to Philadelphia, or up the Brandywine to the celebrated mills, the interests of which are well worthy of attention. Whereas, a vessel arriving at Newcastle and finding the flood tide running, which will always happen if she comes to Welch point with a flood tide, may at once proceed up the Delaware, or up the Brandywine or Christiana creek, without delay. It must also be mentioned, that without a favorable tide, it is difficult to work down the Christiana creek against the wind, which is always unfavorable in some reach or other of its crooked navigation; when, on the contrary, there is ample room in the Delaware to use all advantages of wind and tide.

On the other hand, it must be urged in favor of Christiana creek, that there is navigable water, for boats drawing eight feet, above the proposed termination of the canal, as far as Christiana bridge, and that the navigation may be pushed still higher;—that the little town of Newport is now the depot of the produce of a very extensive and fruitful country extending into Lancaster county, and is 20 miles nearer to Lancaster than Philadelphia, and that to connect so important a field of productive business immediately with the canal, it may be worth while to incur an increased expense and some inconvenience and delay in the mere *thoroughfare* navigation: and it may be added, that the large fixed capital of the town of Wilmington, far exceeding that of Newcastle, demands from the good policy, as well as the good will of the company or the nation, some consideration.

Well aware of the thankless task of giving a decisive and honest opinion on either side, I content myself with furnishing the materials of determination to you, and proceed to describe the nature and

principles of the work actually executed in the feeder, and proposed for the canal.

Between the waters of the Chesapeake and the Delaware there are three streams which, rising in the high land above the canal, may be brought down to it as feeders, the Christiana creek, the Whiteclay creek, and the Elk itself.

The Elk and the Whiteclay are nearly equal in the regular quantity of water they supply, the Christiana is both smaller and more irregular. The Elk descends, in a very crooked and rapid stream, 84 feet in four miles, from Elk forge to the tide near Elkton, and unites with the wide water of the Chesapeake at Turkey point. The ridge that separates its waters from those of the Delaware terminates in a high insulated hill, called Gray's hill, which is united to the high land by a low and narrow ridge, crossing the post road on the boundary line of Delaware and Maryland. The Christiana creek is the first water falling from the high land into the Delaware. It collects all the waters that fall round the high insulated hill called Iron hill, at the N. E. foot of which it turns to the N. E. and running in that direction, under the foot of the granite ridge, into the Delaware, receives the Whiteclay, Redclay and Brandywine, in its course, and also numerous land drains, from the level land, to the south east. Of these three streams it has been ascertained that they may all be brought to the canal, but the Elk with the least expense and the shortest cut. The valleys in which they all run having been worn in deep and rocky land, and branching into deep ravines, the beds of rapid rivulets, offer great difficulties to the work necessary to divert their course.

In the Elk feeder, the canal is cut in the rock for about half a mile; embankments are made across several valleys, but the principal difficulty and expense consisted in cutting through a tongue of high land called Bell hill, through which the digging is 30 feet for near half a mile,and again through the dividing ridge, to the depth of 25 feet for above half that distance; these two difficulties have been conquered. Another smaller hill remains to be cut through, but it may be avoided by a circuitous cut, much less expensive, but also much less eligible. On the Delaware side of the ridge, the feeder is cut through a swampy flat of more than a mile in length, while the descent is only six inches. The general elevation of this flat is 86 feet above the tide, and as the head of the feeder at Elk forge is only 84 feet, it could have little descent, and falls only two inches in a mile. It has on this occount been made a spacious canal of three feet six inches water, twenty two feet six inches on the surface, and twelve feet at the bottom, affording, as far as it goes, a good and valuable inland navigation. The feeder is six miles in length; at the end of five miles is a lock for the passage of boats, and a side cut to communicate with the reservoir. A contiguous valley offers the means of making a reservoir, of more than a hundred acres. It has been proposed to embank 30 acres for this purpose. The lock is of 10 feet lift. The reservoir will be level with the upper feeder, of course 10 feet above the level of the canal, and under such a head will give the canal a plenteous and rapid supply as it is wanted. Below the lock the feeder is five feet deep, and 27 feet on the surface of the water: it will join the canal about a mile west of Aikentown. In the construction of the feeder, permanence has been a very principal consideration. All the culverts are of solid masonry; no land water can run into the cut; the banks are sloped as two to three; the embankments are well puddled, and the piers of the bridges are of hewn stone.

From the description which I have given of the soil of the peninsula, it is evident that the amount of digging constitutes the chief expense of the canal. To lessen this amount and to shorten the canal, it is proposed to quit the level in three places, and to cross three land drains that lead into Christiana creek, one at Aikentown, and two between Aikentown and the Bear. Small aqueducts and short embankments only are necessary to effect this. If the canal should terminate at Newcastle, a narrow marsh must also be crossed—if at Christiana, deeper cutting must be encountered.

But neither of these difficulties increase the expense of the canal more than $7,500 each, beyond that of the same length of the general cut.

On all other points the report of the committee furnishes ample information; and I will only add—that neither in Europe, nor in our own country, do I know a line of inland navigation, which by so short a distance, and at so easy an expense, unites such extensive and productive ranges of commercial intercourse.

With the highest respect, I am yours,

(Signed) B. H. LATROBE.

Albert Gallatin, esq. Secretary of treasury.

POSTSCRIPT.

April 1, 1808.

In the questions proposed to me, by you, the subject of artificial roads was comprehended. But being informed by you that the canal companies of Pennsylvania and Maryland, had transmitted to you ample accounts of their undertakings, and as in their works, experience has taught a system and mode of execution, of the most perfect kind; I have refrained from adding any thing to the information thus acquired. It has however occurred to me, that a few remarks upon rail roads might not be unacceptable to you, especially as the public attention has been often called to this sort of improvement, and the public mind filled with very imperfect conceptions of its utility.

Rail roads may be constructed of iron or of timber. The most durable (but also the most expensive) rail roads, consist of iron *rails* let down on stone foundations; such roads will last for ages. Cast iron rails recured on beds of timber, are sufficiently durable for our country, and of moderate expense. Rail roads, entirely of timber, are fit only for temporary purposes.

A rail road consists of two parallel ways, one pair for going, the other for returning carriages: single roads, with occasional passing places, are applicable to some situations, and are of course less expensive. I will concisely describe the road best adapted to the objects that in our country can be attained by it:—*The rails* are of cast iron, and consist of a tread and a flanch, forming in their section the letter ⊐. The tread is three inches wide, the flanch two inches high. The rails need not be more than 5-8 of an inch *average* thickness, and they may be cast in lengths of five to six feet each; each rail will, at six feet length, contain 225 cubic inches, which, at four inches to the pound, is 56lb. each rail, or one cwt. for every six feet in length of the road, or 44 ton per mile.

In order to form a road of these rails, they must be laid at the distance of from three and an half to five feet (according to the carriage that is to run upon them) parallel to each other; the ends of every two pair of rails being let and pinned down into a piece of timber lying across the roads, the holes for the pins must *be cast* in the rails. These pieces of timber may be of any form, provided they are level at the top, and they cannot be a great part of the expense of the road in any situation. The most durable timber is certainly the best: but no timber can be very durable in the situation it must occupy on the surface, and partly or wholly covered with earth. The perfection of the road consists in the parallel rails being laid perfectly level with each other across the road, and perfectly jointed. In most parts of the union, the rails could, I think, be delivered at from 80 to 90 dollars per ton, and in many at 60—but taking 80 as the average on the spot, the road will cost—

Rails delivered, 44 ton, at 80 dollars,	3,520
Levelling the road, very uncertain, but I will suppose as an average for levelling, and filling in with good gravel or broken stone, two dollars and fifty cents per perch, or per mile	800
Timber and bedding at 50 per rail,	440
Incidents and superintendance,	240
	5,000
For a set of returning ways,	5,000
Total per mile, dolls.	10,000

The carriages, which travel on these roads, may be of various dimensions, agreeably to the material to be conveyed, and the necessary angle of the road. They have low cast iron wheels fast upon the axle, which turns round. Thus, the two wheels on the axle making the same number of revolutions in the same space of time, the carriage necessarily goes straight forward, and cannot be thrown of the ways by any small obstruction on one side.

clay are found in abundance for all purposes of puddling.

The advantage of so level and soft a surface for the cut is counterbalanced by the total absence of water to supply it. This circumstance is very important in determining the choice of the line of the canal, among so many that are equally practicable; for as all its water must be brought from the higher grounds upon the ridge, its location ought to be as near to the ridge as possible, in order that, the feeder being short, the leakage and evaporation of a long feeder may be avoided. The location of the two ends of the canal does not, however, entirely depend upon its general course along the summit; and a great variety of terminations have been proposed, as equally eligible both to the Chesapeake and Delaware side. The former, after long and careful exmination, has been decided in favor of Welch point, where there has, within the memory of man, been no diminution in the depth of the water, which is below the deposite of alluvium from Elk creek, and were the water is so wide and so deep, as to form a very capacious basin for many years to come, for the inconsiderable land wash of Back creek and the small drains in the neighborhood. But, on the Delaware side, much difference of opinion has prevailed. The summit level of the canal in every case must reach the principal road leading from Christiana bridge down the peninsula, near a tavern called the Bear. This place is only two miles distant from Hamburg or Red hook, on the bay of Newcastle, and a cheap and short cut might be made to either of these points, especially to Red hook, did not two considerations forbid it—the broad and wild water of the bay, and its shallowness at a great distance from the shore, there being only four feet six inches at low water. Newcastle is the next eligible point. Newcastle is situated on a prominent point, which is swept both by the flood and the ebb tide. There will therefore be always deep water at the *outer* wharves and piers at that place, and less than 21 feet has not been found on the outside of any of the piers lately erected; or formerly, and even at present, at the wharves, excepting only where the eddy occasioned by the piers has accumulated soft banks of mud.

There could not be a moment's hesitation in fixing the termination of the canal at Newcastle, unless the following reasons should be thought to outweigh the advantages of the best water in the Delaware, and the shortest navigation across the peninsula, which this point offers. It is in the first place feared, that in time of war, when the canal would be invaluable as a means of conveyance of military stores and bodies of men, an enemy's ship of war might destroy the works at Newcastle in a sudden incursion, and return to sea, before the mischief could be prevented. It is further urged, that the mouth of the canal on the river below the tide would be liable to be filled up, in a very short time, as are all places on the Delaware where there is an eddy. And it is also alleged, that Newcastle is situated so far below Philadelphia (33 miles) that, unless with a favorable wind, dull sailing vessels cannot reach Newcastle in one tide, when they might reach the mouth of Christiana, four miles higher up the river, and go up the creek with the flood.

The first argument, appears to me to be deserving of consideration in a national point of view, and a small fort would be necesary to defend the mouth of the works against an enemy who should attempt to land to blow them up. But they could not be injured, even by shells, beyond the destruction of the gates, which a few hours could put again into repair. To obviate the second objection it would be necessary to place the tide lock as far out as possible, and to carry out and wharf the side of the canal below the lock as far into the river, as the most projected wharf. The line of the wharves is now limited to 600 feet beyond the lowest street, called Water street, and unless further protruded into the river by a law of the state, this distance presents no formidable difficulty to the work, and places the utmost extention of the wharves beyond the present time. The third objection is not without foundation. But the narrow and crooked navigation of Christiana creek, presents infinitely more causes of delay than the distance of four miles in the bold navigation of the Delaware.—There is, however, in these objections enough to render it an object of infinite importance both to the nation and to the company, to avail themselves of both the eastern terminations of the canal, and to make a cut also from the Bear to the Christiana creek, about three miles above Wilmington, on a line not altogether so favorable, nor so short as that to Newcastle, but presenting no difficulties of importance whatsoever. From the point (Mendenhall's) at which the termination is proposed, 10 feet may be carried out to the river Delaware.—The objections to this termination are: the tedious and very crooked navigation of the creek for seven miles to the Delaware. The drawbridge at Wilmington, which must be passed; but more than any other, the opposition of the tides of Delaware and Christiana creek. For if a boat comes into the canal at Welch point at high water, and passes across in six hours, she will find half flood in Christiana, and must wait the ebb to go down. On her arrival in the Delaware, in two and a half or three hours, she will have again to wait three or four hours for the flood to proceed to Philadelphia, or up the Brandywine to the celebrated mills, the interests of which are well worthy of attention. Whereas, a vessel arriving at Newcastle and finding the flood tide running, which will always happen if she comes to Welch point with a flood tide, may at once proceed up the Delaware, or up the Brandywine or Christiana creek, without delay. It must also be mentioned, that without a favorable tide, it is difficult to work down the Christiana creek against the wind, which is always unfavorable in some reach or other of its crooked navigation; when, on the contrary, there is ample room in the Delaware to use all advantages of wind and tide.

On the other hand, it must be urged in favor of Christiana creek, that there is navigable water, for boats drawing eight feet, above the proposed termination of the canal, as far as Christiana bridge, and that the navigation may be pushed still higher;—that the little town of Newport is now the depot of the produce of a very extensive and fruitful country extending into Lancaster county, and is 20 miles nearer to Lancaster than Philadelphia, and that to connect so important a field of productive business immediately with the canal, it may be worth while to incur an increased expense and some inconvenience and delay in the mere *thoroughfare* navigation: and it may be added, that the large fixed capital of the town of Wilmington, far exceeding that of Newcastle, demands from the good policy, as well as the good will of the company or the nation, some consideration.

Well aware of the thankless task of giving a decisive and honest opinion on either side, I content myself with furnishing the materials of determination to you, and proceed to describe the nature and

principles of the work actually executed in the feeder, and proposed for the canal.

Between the waters of the Chesapeake and the Delaware there are three streams which, rising in the high land above the canal, may be brought down to it as feeders, the Christiana creek, the Whiteclay creek, and the Elk itself.

The Elk and the Whiteclay are nearly equal in the regular quantity of water they supply, the Christiana is both smaller and more irregular. The Elk descends, in a very crooked and rapid stream, 84 feet in four miles, from Elk forge to the tide near Elkton, and unites with the wide water of the Chesapeake at Turkey point. The ridge that separates its waters from those of the Delaware terminates in a high insulated hill, called Gray's hill, which is united to the high land by a low and narrow ridge, crossing the post road on the boundary line of Delaware and Maryland. The Christiana creek is the first water falling from the high land into the Delaware. It collects all the waters that fall round the high insulated hill called Iron hill, at the N. E. foot of which it turns to the N. E. and running in that direction, under the foot of the granite ridge, into the Delaware, receives the Whiteclay, Redclay and Brandywine, in its course, and also numerous land drains, from the level land, to the south east. Of these three streams it has been ascertained that they may all be brought to the canal, but the Elk with the least expense and the shortest cut. The valleys in which they all run having been worn in deep and rocky land, and branching into deep ravines, the beds of rapid rivulets, offer great difficulties to the work necessary to divert their course.

In the Elk feeder, the canal is cut in the rock for about half a mile; embankments are made across several valleys, but the principal difficulty and expense consisted in cutting through a tongue of high land called Bell hill, through which the digging is 30 feet for near half a mile, and again through the dividing ridge, to the depth of 25 feet for above half that distance; these two difficulties have been conquered. Another smaller hill remains to be cut through, but it may be avoided by a circuitous cut, much less expensive, but also much less eligible. On the Delaware side of the ridge, the feeder is cut through a swampy flat of more than a mile in length, while the descent is only six inches. The general elevation of this flat is 86 feet above the tide, and as the head of the feeder at Elk forge is only 84 feet, it could have little descent, and falls only two inches in a mile. It has on this account been made a spacious canal of three feet six inches water, twenty two feet six inches on the surface, and twelve feet at the bottom, affording, as far as it goes, a good and valuable inland navigation. The feeder is six miles in length; at the end of five miles is a lock for the passage of boats, and a side cut to communicate with the reservoir. A contiguous valley offers the means of making a reservoir, of more than a hundred acres. It has been proposed to embank 30 acres for this purpose. The lock is of 10 feet lift. The reservoir will be level with the upper feeder, of course 10 feet above the level of the canal, and under such a head will give the canal a plenteous and rapid supply as it is wanted. Below the lock the feeder is five feet deep, and 27 feet on the surface of the water: it will join the canal about a mile west of Aikentown. In the construction of the feeder, permanence has been a very principal consideration. All the culverts are of solid masonry; no land water can run into the cut; the banks are sloped as two to three; the embankments are well puddled, and the piers of the bridges are of hewn stone.

From the description which I have given of the soil of the peninsula, it is evident that the amount of digging constitutes the chief expense of the canal. To lessen this amount and to shorten the canal, it is proposed to quit the level in three places, and to cross three land drains that lead into Christiana creek, one at Aikentown, and two between Aikentown and the Bear. Small aqueducts and short embankments only are necessary to effect this. If the canal should terminate at Newcastle, a narrow marsh must also be crossed—if at Christiana, deeper cutting must be encountered.

But neither of these difficulties increase the expense of the canal more than $7,500 each, beyond that of the same length of the general cut.

On all other points the report of the committee furnishes ample information; and I will only add—that neither in Europe, nor in our own country, do I know a line of inland navigation, which by so short a distance, and at so easy an expense, unites such extensive and productive ranges of commercial intercourse.

With the highest respect, I am yours,
(Signed) B. H. LATROBE.

Albert Gallatin, esq. Secretary of treasury.

POSTSCRIPT.

April 1, 1808.

In the questions proposed to me, by you, the subject of artificial roads was comprehended. But being informed by you that the canal companies of Pennsylvania and Maryland, had transmitted to you ample accounts of their undertakings, and as in their works, experience has taught a system and mode of execution, of the most perfect kind; I have refrained from adding any thing to the information thus acquired. It has however occurred to me, that a few remarks upon rail roads might not be unacceptable to you, especially as the public attention has been often called to this sort of improvement, and the public mind filled with very imperfect conceptions of its utility.

Rail roads may be constructed of iron or of timber. The most durable (but also the most expensive) rail roads, consist of iron *rails* let down on stone foundations; such roads will last for ages. Cast iron rails recured on beds of timber, are sufficiently durable for our country, and of moderate expense. Rail roads, entirely of timber, are fit only for temporary purposes.

A rail road consists of two parallel ways, one pair for going, the other for returning carriages: single roads, with occasional passing places, are applicable to some situations, and are of course less expensive. I will concisely describe the road best adapted to the objects that in our country can be attained by it:—*The rails* are of cast iron, and consist of a tread and a flanch, forming in their section the letter ⊐. The tread is three inches wide, the flanch two inches high. The rails need not be more than 5-8 of an inch *average* thickness, and they may be cast in lengths of five to six feet each; each rail will, at six feet length, contain 295 cubic inches, which, at four inches to the pound, is 56lb. each rail, or one cwt. for every six feet in length of the road, or 44 ton per mile.

In order to form a road of these rails, they must be laid at the distance of from three and an half to five feet (according to the carriage that is to run upon them) parallel to each other; the ends of every two pair of rails being let and pinned down into a piece of timber lying across the roads, the holes for the pins must *be cast* in the rails. These pieces of timber may be of any form, provided they are level at the top, and they cannot be a great part of the expense of the road in any situation. The most durable timber is certainly the best: but no timber can be very durable in the situation it must occupy on the surface, and partly or wholly covered with earth. The perfection of the road consists in the parallel rails being laid perfectly level with each other across the road, and perfectly jointed. In most parts of the union, the rails could, I think, be delivered at from 80 to 90 dollars per ton, and in many at 60—but taking 80 as the average on the spot, the road will cost—

Rails delivered, 44 ton, at 80 dollars,	3,520
Levelling the road, very uncertain, but I will suppose as an average for levelling, and filling in with good gravel or broken stone, two dollars and fifty cents per perch, or per mile	800
Timber and bedding at 50 per rail,	440
Incidents and superintendance,	240
	5,000
For a set of returning ways,	5,000
Total per mile, dolls.	10,000

The carriages, which travel on these roads, may be of various dimensions, agreeably to the material to be conveyed, and the necessary angle of the road. They have low cast iron wheels fast upon the axle, which turns round. Thus, the two wheels on the axle making the same number of revolutions in the same space of time, the carriage necessarily goes straight forward, and cannot be thrown of the ways by any small obstruction on one side.

The principle, upon which such astonishing loads may be drawn on the ways by a single horse, is the diminution of friction in the greatest possible degree. On a good rail road, descending under an angle of one degree, one horse may draw eight tons in four waggons of two tons each without difficulty. The astonishing loads drawn upon rail roads, by single horses, in England, have induced many of our citizens to hope for their early application to the use of our country. I fear this hope is vain, excepting on a very small scale, and that chiefly in the coal country near Richmond. For it is evident, that upon a rail road no other carriage but that which is expressly constructed for the purpose, can be employed,—and that to render a rail road sufficiently saving of the expense of common carriage, to justify the cost of its erection, there must be a very great demand for its use. But the sort of produce which is carried to our markets is collected from such scattered points and comes by such a diversity of routes, that rail roads are out of the question as to the carriage of common articles. Rail roads, leading from the coal mines to the margin of James river, might answer their expense, or others from the marble quarries near Philadelphia to the Schuylkill. But these are the only instances within my knowledge, in which they at present might be employed.

There is, however, a use for rail roads as a temporary means of overcoming the most difficult parts of artificial navigation, and for this use they are invaluable, and in many instances offer the means of accomplishing distant lines of communication which might otherwise remain impracticable, even to our national resources, for centuries to come.

(F.)

MR. FULTON'S COMMUNICATION.

SIR,—By your letter of the 29th of July, I am happy to find that the attention of congress is directing itself towards the opening of communications through the United States, by means of roads and canals; and it would give me particular pleasure to aid you with useful information on such works, as I have long been contemplating their importance in many points of view.

But a year has not yet elapsed since I returned to America, and my private concerns have occupied so much of my time that as yet I have acquired but very little local information on the several canals which have been commenced.

Such information, however, is perhaps at present not the most important branch of the subject, particularly as it can be obtained in a few months at a small expense, whenever the public mind shall be impressed with a sense of the vast advantages of a general system of cheap conveyance.

I hope, indeed, that every intelligent American will, in a few years, be fully convinced of the necessity of such works to promote the national wealth, and his individual interest. Such conviction, must arise from that habit of reflection which accompanies the republican principle, and points out their true interest on subjects of political economy. From such reflections arises their love of agriculture and the useful arts, knowing them to augment the riches and happiness of the nation; hence also their dislike to standing armies and military navies, as being the means of increasing the proportion of non-productive individuals, whose labor is not only lost, but who must be supported out of the produce of the industrious inhabitants, and diminish their enjoyments.

Such right thinking does great honor to our nation, and leads forward to the highest possible state of civilization, by directing the powers of man from useless and destructive occupations, to pursuits which multiply the productions of useful labor, and create abundance.

Though such principles actuate our citizens, they are not yet, in every instance, aware of their best interests; nor can it be expected that they should perceive at once the advantages of those plans of improvement which are still new in this country. Hence the most useful works have sometimes been opposed; and we are not without examples of men being elected into the state legislatures for the express purpose of preventing roads, canals and bridges being constructed. But in such errors of judgment our countrymen have not been singular. When a bill was brought into the British parliament, fifty years ago, to establish turnpike roads throughout the kingdom, the inhabitants, for forty miles round London, petitioned against such roads; their arguments were, that good roads would enable the farmers of the interior country to bring their produce to the London market, cheaper than they who lived nearer the city, and paid higher rent; that the market would be overstocked; the prices diminished and they unable to pay their rent, or obtain a living. The good sense of parliament, however, prevailed; the roads were made, the population and commerce of London increased, the demand for produce increased, and he who lived nearest to London, still had a superior advantage in the market.

In like manner, I hope the good sense of our legislature will prevail over the ignorance and prejudice which may still exist against canals. And here an important question occurs, which it may be proper to examine with some attention in this early stage of our public improvements,—whether, as a system, we should prefer canals to turnpike roads? Our habits are in favor of roads; and few of us have conceived any better method of opening communications to the various parts of the states. But in China, and Holland, canals are more numerous than roads; in those countries the inhabitants are accustomed to see all their productions carried either on natural or artificial canals, and they would be as much at a loss to know how we, as a civilized people, could do without such means of conveyance, as we are surprised at their perseverance and ingenuity in making them.* England, France, and the principal states of Europe, commenced their improvements with roads; but as the science of the engineer improved, and civilization advanced, canals were introduced, and England and France are now making every exertion to get the whole of their heavy productions water-borne, for they have become sensible of the vast superiority of canals over roads.

Our system perhaps ought to embrace them both: canals for the long carriage of the whole materials of agriculture and manufactures, and roads for travelling and the more numerous communications of the country. With these two modes in contemplation, when public money is to be expended with a view to the greatest good, we should now consider which object is entitled to our first attention. Shall we begin with canals, which will carry the farmer's produce cheap to market, and return him merchandize at reduced prices? Or shall we first make roads to accommodate travellers, and let the produce of our farms, mines and forests, labor under such heavy expenses that they cannot come to market?

To throw some light on this interesting question, I will base my calculations on the Lancaster turnpike road. There the fair experiment has been made to penetrate from Philadelphia to the interior country, and the mode of calculation here given will serve for drawing comparisons on the utility of roads and canals, for all the great leading communications of America.

From Philadelphia to the Susquehannah at Columbia, is 74 miles; that road, if, I am rightly informed, cost on an average, 6,000 dollars a mile, or 444,000 for the whole. On it, from Columbia to Philadelphia, a barrel of flour, say 200 weight, pays one dollar carriage. A broad wheeled waggon carries thirty barrels or three tons, and pays for turnpike three dollars; thus for each ton carried the turnpike company receives only one dollar.

I will now suppose a canal to have been cut from Philadelphia, to Columbia, and its windings to make 100 miles, at 15,000 dollars* a mile, or for the whole 1,500,000 dollars. On such a canal, *one man*, *one boy* and *horse*, would convey 25 tons 20 miles a day,† on which the following would be the expenses:

One man,	1 00
One horse	1 00
One boy,	50
Tolls for repairing the canal,	1 00
Tolls for passing locks, inclined planes, tunnels and aqueducts,	1 00
Interest on the wear of the boat,	50
Total,	5 00

This is equal to 20 cents a ton for 20 miles, and no more than one dollar a ton for 100 miles, instead of ten dollars paid by the road. Consequently for each ton carried from Columbia to Philadelphia, on the canal, the company might take a toll of six dollars, instead of one, which is now got by the road; and then the flour would arrive at philadelphia for seven dollars a ton, instead of ten, which it now pays. The merchandize would also arrive at Columbia, from Philadelphia, for three dollars a ton less than is now paid; which cheap carriage, both ways, would not only benefit the farmer and merchant, but would draw more commerce on the canal, than now moves on the road, and thereby add to the profits of the company.

But, to proceed with my calculations, I will suppose that exactly the same number of tons would move on the canal that are now transported by the road. Again, let it be supposed that at one dollar a ton the turnpike company gains five per cent. per annum on their capital of 444,000 dollars, or 22,200 dollars, consequently, 22,200 tons must be carried, which at six dollars a ton, to the company would have given 133,200 dollars a year, or 8 1-2 per cent. for their capital of 1,500,000 dollars.

The reason of this vast difference in the expense of carriage by roads or canals, will be obvious to any one who will take the trouble to reflect, that on a road of the best kind, four horses, and sometimes five, are necessary to transport only three tons. On a canal one horse will draw 25 tons, and thus perform the work of 40 horses; the saving therefore is in the value of the horses, their feeding, shoeing, geer, waggons, and attendance. These facts should induce companies to consider well their interest, when contemplating an enterprise of this sort, and what would be their profits, not only in interest for their capital, but the benefit which their lands would receive by the cheap carriage of manure and of their productions.

In considering the profit to accrue to a company from a canal instead of roads, there is another important calculation to be made, and for that purpose I will proceed with the Lancaster turnpike, supposing it to extend to Pittsburg, 320 miles. On which the carriage being at the rate now paid from Columbia to Philadelphia, that is ten dollars a ton for 74 miles, the ton from Pittsburg, would amount to 42 dollars, at which price a barrel of flour would cost four dollars in carriage, an expense which excludes it from the market. Thus grain, the most important and abundant production of our interior country, and which should give vigor to our manufactures, is shut up in the districts most favorable to its culture; or to render it portable, and convert it into cash, it must be distilled to brutalize and poison society. In like manner all heavy articles of little monied value, can only move within the narrow limits of 100 miles; but were a canal made the whole distance, and by one or more companies, they might arrange the tolls in the following manner, so as to favor the long carriage of heavy articles.

The expense of man, boy, and horse, as before stated, would cost only three dollars to boat one ton of flour, 300 miles, this is thirty

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* The royal canal from Canton to Pekin, is 825 miles long, its breadth fifty feet, its depth nine feet.

*On averaging the canals of America, 15,000 dollars a mile will be abundantly sufficient to construct them in the best manner, particularly if made on the inclined plane principle, with small boats, each carrying six tons.

†One horse will draw, on a canal, from 25 to 50 tons, 20 miles in one day. I have stated the least they ever do, and the highest rate of charges, that no deception may enter into these calculations.

cents a barrel; suppose then, that the company receive 70 cents a barrel, or seven dollars a ton, flour could then come from Pittsburgh to Philadelphia for one dollar a barrel, the sum which is now paid from Columbia; thus the canal company would gain seven dollars a ton, by a trade which could never move through a road of equal length. Here we see that on canals the tolls may be so arranged as to draw to them articles of little monied value, and it would be the interest of the company or companies, to make such regulations. But on turnpike roads, no such accommodation of charges, in proportion to distance, can be effected, because of the number of horses which cannot be dispensed with.* Even were the roads made at the public expense, and toll free, still the carriage of one ton, for three hundred miles, would cost, at least, 35 dollars. But were canals made at the public expense, and no other toll demanded than should be sufficient to keep them in repair, a ton in boating and tolls would only cost three dollars for 300 miles; and for thirty-five dollars, the sum which must be paid to carry one ton 300 miles on the best of roads, it could be boated *three thousand five hundred miles*, and draw resources from the centre of this vast continent.

But striking as this comparison is, I will still extend it. The merchandize which can bear the expense of carriage on our present roads to Pittsburg, Kentucky, Tennessee, or any other distance of 300 miles, and which for that distance pays 100 dollars a ton, could be boated on canals, *ten thousand miles for that sum*.

As these calculations are founded on facts which will not be denied by any one acquainted with the advantages of canals, it is the interest of every man of landed property, and particularly of the farmers of the back countries, that canals should be immediately constructed and rendered as numerous as the funds of the nation will permit, and the present population requires; and as the inhabitants multiply most towards the interior, and must extend westward, still moving more distant from the sea coast, and the market for their produce, it is good policy and right that canals should follow them. In 25 years, our population will amount to fourteen millions; two-thirds of whom will spread over the western countries. Suppose then, that 3,500,000 dollars were annually appropriated to canals, such a sum would pay for 300 miles of canal each year, and in twenty years we should have 6000 miles circulating through, and penetrating into the interior of the different states; such sums, though seemingly large, and such works, though apparently stupendous, are not more than sufficient to keep pace with the rapid increase of our population, to open a market and carry to every district such foreign articles as we near the coast enjoy. With this view of the subject, arises a political question of the utmost magnitude to these states—which is—

That as our national debt diminishes, and the treasury increases in surplus revenue, will it not be the best interest of the people to continue the present duties on imports, and expend the products in national improvements?

To illustrate this question, I will state some examples of the rate of duties and the expense of carriage, to prove that by keeping on the duties and making canals with the revenue, goods in a great number of instances will be cheaper to the consumer, than by taking off the duties, and leaving the transport to roads.

FIRST EXAMPLE:

Brown sugar pays in duty, two and an half cents a lb. or for 100 lb.	2 50
It pays for waggoning 300 miles,	5 00
Total, dolls.	7 50

By the canal, it would cost in boating fifteen cents, for 300 miles; consequently the boating and duty would amount to two dollars and sixty-five cents; therefore, by keeping on the duty and making canals, sugar would arrive at the interior, 300 miles, for two dollars and thirty-five cents the hundred weight cheaper, than if the duties were taken off, and the transport left to roads.

SECOND EXAMPE:

One bushel of salt, weighing 56lb. paid in duty,	0 20
To carry it 300 miles by roads, the expense is	2 50
Total, dolls.	2 70

By the canal it would cost for boating 300 miles, seven and a half cents. By keeping on the duties, and making the canals, it would arrive to the interior consumer at two dollars thirty-two and an half cents the bushel cheaper than were the duties taken off, and the transport left to roads.

THIRD EXAMPLE:

Molasses pays five cents a gallon duty, this is for 100lb. .	0 75
It pays for waggoning 300 miles,	5 00
Total, dolls.	5 75

By the canal, the carriage would cost fifteen cents, and it would arrive at the interior, at four dollars and ten cents the hundred weight, or twenty-seven cents a gallon cheaper than were the duties taken off, and the transport left to roads.

Numerous other articles might be stated to shew that the real mode of rendering them cheap to the interior consumer, is to keep on the duties and facilitate the carriage with the funds so raised. These, however, may be considered as partial benefits, and not sufficiently general to warrant keeping on the duties. But there is a point of view in which I hope it will appear, that the advantages are general, and will be felt throughout every part of the states. It is by reducing the expense of all kinds of carriage, and thus economise to each individual more than he now pays in duty on the foreign articles which he consumes.

*In my work on small canals, published in 1796, page 140, there is a table shewing a mode of regulating the boating and tonnage, in such manner, that a ton may be transported 1,300 miles, for five dollars. Yet by this method canal companies would gain more toll than by any other means yet practised.

FOR EXAMPLE:

Wood, for fuel, is an article of the first necessity; it cannot bear the expense of transport twenty miles on roads; at that distance, it is shut out from the market, and the price of fuel is consequently raised the amount of the carriage; were a cord of wood carried 20 miles on roads, it would pay for waggoning at least three dollars; on a canal it would pay twenty cents; thus, on only one cord of wood, there is an economy of two dollars and eighty cents,—which economy would pay the duty on fourteen pounds of tea, at twenty cents the lb. duty;

Or 140 pounds of sugar, at two cents the lb. duty;
Or 56 pounds of coffee, at five cents the lb. duty,
Or 14 bushels of salt, at 20 cents the bushel duty;
Or 56 gallons of molasses, at five cents the gallon duty.

I will now suppose a city of 50,000 inhabitants, who, for their household and other uses, will consume 50,000 cords a year, on which there would be an economy of 140,000 dollars, a sum in all probability equal to the duties paid by the inhabitants. For the duties, divided on the whole of American people, are but two dollars and twenty-eight to each individual. Here I have estimated each person to pay two dollars and eighty cents; yet this estimate is made on one cord of wood to each inhabitant of a city; were I to calculate the economy on the carriage of building timber, lime, sand, bricks, stone, iron, flour, corn, provisions and materials of all kinds which enter or go out of a city, it would be five times this sum; and thus the towns and cities are to be benefitted. The farmer or miller, who lives 20 miles from a market, pays at least 22 cents to waggon a barrel of flour that distance; by the canal it would cost two cents, the economy would be 20 cents; at 100 miles the economy would be 100 cents, and at 150 miles it would be 150 cents; beyond this distance flour cannot come to market by roads; yet at this distance the economy of 150 cents on the carriage of one barrel of flour, would pay the duty on

7 1-2 pounds of tea;
Or 75 pounds of sugar;
Or 30 pounds of coffee;
Or 7 1-2 bushels of salt;
Or 30 gallons of molasses.

Thus it is, that the benefits arising from a good system of canals, are general and mutual. Therefore, should peace, and the reduction of the national debt, give an overflowing, I hope you, and the majority of the Americans, will think with me that the duties should not be taken off, nor diminished; for such an act, instead of relieving the people, would really oppress them, by destroying the means of reducing the expense of transport, and of opening to them a cheap mode of arriving at good markets.

To proceed with these demonstrations, let us look at the rich productions of our interior country:

Wheat, flour, oats, barley, beans, grain and pulse of all kinds;
Cyder, apples, fruits of all kinds;
Salt, salted beef, pork and other meats*
Hides, tallow, beeswax;
Cast and forged iron;
Pot and pearl ashes, tanners' bark;
Tar, pitch, rosin and turpentine;
Hemp, flax and wool;
Plaister of paris, so necessary to our agriculture;
Coals, and potters' earth for our manufactures;
Marble, lime and timber for our buildings.

All these articles are of the first necessity, but few of them can bear the expense of five dollars the hundred weight to be transported 300 miles on roads. Yet they would cost in boating only 15 cents the hundred weight, for that distance.

There is another great advantage to individuals and the nation, arising from canals, which roads can never give. It is that when a canal runs through a long line of mountainous country, such as the greater part of the interior of America, all the ground below for half a mile or more may be watered and converted into meadow and other profitable culture.

How much these conveniences of irrigation will add to the produce of agriculture and the beauties of nature, I leave to experienced farmers and agricultural societies to calculate.

In Italy and Spain it is the practice to sell water out of the canals, for watering meadows and other lands. In such cases tubes are put into the canal, under the pressure of a certain head of water, and suffered to run a given time for a fixed price; the monies thus gained add much to the emoluments of the canal companies.

But with all these immense advantages, which canals give, it may be a question with many individuals, whether they can be constructed in great leading lines from our sea coast and navigable rivers, to the frontiers of the several states, or pass our mountains and penetrate to the remotest parts of our interior country. Should doubts arise on this part of the plan, I beg leave to assure you that there is no difficulty in carrying canals over our highest mountains, and even where nature has denied us water. For water is always to be found in the valleys, and the canal can be constructed to the foot of the mountain, carrying the water to that situation. Should there be no water on the mountain or its sides, there will be wood or coals; either or both of which can be brought cheap to the works by means of the canal. Then with steam engines the upper ponds of canal can be filled from the lower levels, and with the engines the boats can, on inclined planes, be drawn from the lower to the upper canal. For this mode of operating it is necessary to have small boats of six tons each. As the steam engines are to draw up and let down the boats on inclined planes, no water is drawn from the upper level of canal as when locks are used. Consequently when the upper

*Animals are now driven to market 300 or more miles, at a considerable expense, and loss of flesh, for two principal reasons: first, the expense of transporting the salt to the interior; and second, the expense of carrying the salted meats to market.

ponds have been once filled, it is only necessary that the engine should supply leakage and evaporation. There is another mode of supplying the leakage and evaporation of the higher levels: On the tops and sides of mountains there are hollows or ravines which can be banked at the lower extremity, thus forming a reservoir to catch the rain or melted snow. From such reservoirs the ponds or canal can be replenished in the dry months of summer. This mode of reserving water is in practice in England for canals, and in Spain for irrigation. In this manner I will suppose it necessary to pass a mountain 800 feet high; then four inclined planes, each of 200 feet rise, would gain the summit, and four would descend on the other side.—Total 8 inclined planes and 8 steam engines. Each steam engine, of 12 horse power, would cost about ten thousand dollars, in all 80,000 dollars; each would burn about 12 bushels of coal in 12 hours, or 96 bushels for the 8 engines for one day's work.

The coals in such situations may be estimated at 12 cents a bushel, or	dolls. 11 52
At each engine and inclined plane there must be 5 men —total 40 men, at one dollar each,	40
Total	dolls. 51 52

For this sum they could pass 500 tons in one day over the 8 inclined planes, which for each ton is only 10 cents.

Suppose the mountain to be 20 miles wide, boating for each ton would cost 20 do.

Total 30 cents

a ton for passing over the mountain, which will be more or less according to circumstances. These calculations being only intended to remove any doubts which may arise on the practicability of passing our mountains.

Having thus, in some degree, considered the advantages which canals will produce in point of wealth to individuals and the nation, I will now consider their importance to the union, and and their political consequences.

First, their effect on raising the value of the public lands, and thereby augmenting the revenue.

In all cases where canals shall pass through the lands of the United States, and open a cheap communication to a good market, such lands will rise in value for 20 miles on each side of the canal. The farmer who will reside 20 miles from the canal can in one day carry a load of produce to its borders. And were the lands 600 miles from one of our seaport towns, his barrel of flour, in weight 200 lb. could be carried that distance for 60 cents, the price which is now paid to carry a barrel 50 miles on the Lancaster turnpike. Consequently, as relates to cheapness of carriage, and easy access to market, the new lands which lie 600 miles from the sea ports, would be of equal value with lands of equal fertility which are 50 miles from the sea ports. But not to insist on their being of so great value until population is as great, it is evident that they must rise in value in a 3 or 4 fold degree, every lineal mile of canal would accommodate 25,600 acres. The lands sold by the United States in 1806, averaged about 2 dollars an acre, and certainly every acre, accommodated with a canal, would produce 6 dollars; thus only 20 miles of canal, each year, running through national lands, would raise the value of 512,000 acres at least 4 dollars an acre, giving 2,048,000 dollars to the treasury, a sum sufficient to make 136 miles of canal. Had an individual such a property, and funds to construct canals to its centre, he certainly would do it for his own interest. The nation has the property, and the nation possesses ample funds for such undertakings.

Second, on their effect in cementing the union, and extending the principles of confederated republican government. Numerous have been the speculations on the duration of our union, and intrigues have been practised to sever the western from the eastern states. The opinion endeavored to be inculcated was, that the inhabitants beyond the mountains were cut off from the market of the Atlantic states; that consequently they had a separate interest, and should use their resources to open a communication to a market of their own; that, remote from the seat of government, they could not enjoy their portion of advantages arising from the union, and that sooner or later they must separate and govern for themselves.

Others, by drawing their examples from European governments, and the monarchies which have grown out of the feudal habits of nations of warriors, whose minds were bent to the absolute power of the few, and the servile obedience of the many, have conceived these states of too great an extent to continue united under a republican form of government, and that the time is not distant when they will divide into little kingdoms, retrograding from common sense to ignorance, adopting all the follies and barbarities which are every day practised in the kingdoms and petty states of Europe. But those who have reasoned in this way, have not reflected that men are the creatures of habit, and that their habits as well as their interests may be so combined, as to make it impossible to separate them without falling back into a state of barbarism. Although in ancient times some specks of civilization have been effaced by hordes of uncultivated men, yet it is remarkable that since the invention of printing and general diffusion of knowledge, no nation has retrograded in science or improvements; nor is it reasonable to suppose that the Americans, who have as much, if not more, information in general, than any other people, will ever abandon an advantage which they have gained. England, which at one time was seven petty kingdoms, has by habit long been united into one. Scotland, by succession, became united to England, and is now bound to her by habit, by turnpike roads, canals and reciprocal interests. In like manner all the counties of England, or departments of France, are bound to each other; and when the United States shall be bound together by canals, by cheap and easy access to market in all directions, by a sense of mutual interests arising from mutual intercourse and mingled commerce; it will be no more possible to split them into independent and separate governments, each lining its frontiers with fortifications and troops, to shackle their own exports and imports to and from the neighboring states, than it is now possible for the government of England to divide and form again into seven kingdoms.

But it is necessary to bind the states together by the people's interests, one of which is to enable every man to sell the produce of his labor at the best market and purchase at the cheapest. This accords with the idea of Hume, "that the government "of a wise people would be little more than a system of civil po-"lice; for the best interest of man is industry and a free exchange "of his labor for the things which he may require."

On this humane principle, what stronger bonds of union can be invented than those which enable each individual to transport the product of his industry 1,200 miles for 60 cents the hundred weight? Here then is a certain method of securing the union of the states, and of rendering it as lasting as the continent we inhabit.

It is now eleven years that I have had this plan in contemplation for the good of our country. At the conclusion of my work on small canals, there is a letter to Thos. Mifflin, then governor of the state of Pennsylvania, on a system of canals for America. In it I contemplated the time when "*canals should pass "through every vale, wind round each hill and bind the whole "country together in the bonds of social intercourse;*" and I am now happy to find that, through the good management of a wise administration, a period has arrived when an overflowing treasury exhibits abundant resources, and points the mind to works of such immense importance.

Hoping speedily to see them become favorite objects with the whole American people,

I have the honor to be your most obedient,

ROBERT FULTON.

To Albert Gallatin, esq. secretary of the treasury.
Washington, Dec. 8, 1807.

☞Mr. *Gallatin's* report on Roads and Canals is now concluded, and room will be afforded for other articles also of much value and considerable length, which we design to publish. We seldom insert any of those very voluminous documents without being tired of them before they are finished, though always proud in being able to say that they are contained in our work—which it is our wish should possess every paper desirable to the statesman; and, certainly, the REGISTER would have been incomplete without Mr. *Gallatin's* most able and most interesting report on roads and canals.

Scraps—about banks and banking.

We can hardly open a newspaper without seemingly hearing a bellowing aloud of "*counterfeiters*" —"*more counterfeiters*"—"*beware of counterfeiters*" —"*forgery*"—"*more forgery,*" and the like. What a pity it is that society should be so much demoralized, and so villainously cheated, for the benefit of a few dronish paper-lords—less substantial than "men in buckram?"

Genuine anecdote. I happened to be in company a few days ago, with a gentleman who is a director in one of our local banks, who observed that he held some stock in the bank of the United States which cost him *one hundred and fifty dollars per share*—on which I said to him, "you are, sir, what a Yankee would call a '*cute* man, and you know that 2 and 2 make 4 as well as any one:—now tell me candidly, why you bought that stock at 150$ a share?" "Because," returned he, promptly, "I expected to find som' d———d fool that would give me *one hundred and fifty two* for it." But the "d———d fools" had been supplied—the people began to calculate, and the bubble bursted.

If it would not touch *individuals* too severely, I could tell a queer story about certain purchasers *by paper*, of *paper stock*, to the amount of $2,880,000 —two millions, eight hundred and eighty thousand dollars of stock, by about the fourth of a dozen of individuals, at an average price of 147 dollars 75 cents per share—in the hope that there would be some of the *sort of "fools"* just above spoken of to take it off their hands, at a vast advance.

Bank robbery. By a letter from a gentleman in Salem, (Mass.) to his friend in this town, dated August 30, we learn that the cashier and clerk of the *Essex bank* lately eloped, carrying with them between *eighty* and a *hundred thousand dollars* in cash belonging to the *Essex* (Salem) *bank*. A few days had been spent in counting the money left in the vault, but the amount missing had not been ascertained. [*Orange Co. Gaz.*

[We also have heard this story of a gentleman direct from Salem—where it was understood, that a large special deposite in gold, (or *money*) was among the spoils carried off. But the Salem papers have been *silent* on the subject:—this is "*management.*"] ED. REG.

Presentment. The grand jury of Jasper county, Geo. for August term, 1818, presented to the court as follows:

"We look on the banking system, except so far as relates to the national bank and its branches, as the root of an evil which threatens great mischief, inconvenience and injustice, in the state of Georgia as well as in the United States. Viewing it (as we earnestly do) as a grievance and very great evil, we have earnestly to recommend to our next legislature, to not only avoid, with the greatest care, favoring an increase of the banks and branch banks of this state, and renewing charters to banks at present established, but further to use their best exertions to prevent the same."

[This is very well—in part. The worthy gentlemen of the grand jury had not heard of the late "equalization of exchange!"]

It will go on. We are authorised to assure the democratic republicans of this district, that *all the candidates* on the "regularly nominated democratic republican delegation ticket," are not only in favor of taxing the *bank of the United States*—but also in favor of some legislative provision, by which *all* the chartered *banks of Pennsylvania* will be compelled to live up to the spirit of their charters, by actually paying, on all occasions, specie for their notes—by which means the people will no longer be either *shaved* or *swindled*—*Pittsburg Statesman.*

["Federalists" are as well interested in this thing as "democrats;"—it is a matter in which all *honest* men may rightfully unite.]

From the Westmoreland Republican.—Mr. Wise, You are requested to state in your paper, that the democratic republican candidates for congress and assembly, are decidedly in favor of taxing the bank of the United States, and are also favorable to the adoption of such measures, as will compel the chartered banks of this state to render justice to the public by redeeming their notes with specie, when demanded. *A citizen of Westmoreland.*

☞The like is doing in many other quarters. For or against the "*paper system,*" is the question in several states. It is resolved to reform or break down the manufactory of paper money; one or the other must be done—and, I repeat it, the sooner the better.

The *Chillicothe Supporter* of Aug. 26, says—It is stated on the authority of gentlemen from Cincinnati, that the United States branch bank at that place, has called on the other banks for the balance due the branch of about 700,000 dollars, in requisitions of 20 per cent. every thirty days—being *only* $140,000 every month. [Owing the money, they ought to pay it.]

One of the writers in a Chillicothe paper says, that upwards of *three thousand dollars* were expended by the bank of Chillicothe, in paying agents to travel to Philadelphia, for the purpose of procuring a branch of the United States bank! Dr. Franklin would call this "paying too dear for the whistle."

Another paper states the singular fact, that the notes of *one half* of the banks lately chartered by that state, are refused to be received in payment of the state taxes! The number of the banks in Ohio whose notes are thus refused, is *sixteen. Quosque tandem—*

The Harrisburg, (Pa.) Republican says—At one single court, at the last May court, alone, the Harrisburg bank brought suits against upwards of *one hundred* persons, for not more than *forty* debts.

The *Boston Yankee*, noticing the organization of the branch of the United States bank at that place remarked, in January 1817,—"that it was under the control of the most active members of the HARTFORD CONVENTION."

"TAKE ANY SHAPE BUT THAT"——

From the Enquirer.

The mother bank of the United States has come to the extraordinary resolution of refusing to receive the notes of its own offices, except "in payment of debts due to the United States." The *state* banks of Philadelphia have properly followed suit, and will no longer receive the notes of these branches. All the state banks should adopt the same example—and no notes ought to be received but those of the contiguous branch. For, the United States bank, except as it relates to the public revenue, is thus cut up in the circulation of its paper into a series of separate independent banks. What now becomes of the boasted advantages, promised from this mammoth institution, in equalizing the rate of exchange between different parts of the country? The United States bank paper will also fluctuate in its value—and may be below par in different places, for the same reason, though not in the same ratio, as the paper of the state banks. To this complexion has this unconstitutional institution came at last!

From the Aurora.

Mr. Duane.—It is requested by a friend of the public, that the names of the president, directors and cashier of the bank of the United States be published, for the injury they have done the community, by *holding out false colors, in issuing their branch notes, and paying the same at their banking house in Philadelphia, for checks, and afterwards refusing to take the same in payment of notes or on deposit, except for duties payable to the United States.* To wit:

DIRECTORS OF THE BANK OF THE UNITED STATES:

WILLIAM JONES, president.

JONATHAN SMITH, cashier.

Pierce Butler	Cadwallader Evans, jun.
Walter Bowne, N. Y.	Samuel Wetherill
George Williams, Balt.	Thomas M'Euen
Robert Ralston	John Savage
Chandler Price	John Goddard
Thomas M. Willing	John Bolton, Savannah
James C. Fisher	Henry Clay, Kentucky*
John Connelly	John Sergeant
Dennis A. Smith, Balt.	Nathl. Prince, N. York.
John Bohlen	John Coulter
John Donnel, Balt.	Joshua Lippincott
Thomas Leiper	John Lisle

*We publish this list cheerfully; but it is a duty which we owe to truth and justice, to state a fact concerning a gentleman, who not being present to do himself justice, though we have neither personal acquaintance nor correspondence with him, nor any friend of his, to state the fact. Mr. Clay, of

From the same.

The *great bank*—is making great *havock* among some of its *supporters;* the state of business and circulation was never perhaps in a more deplorable state than at this moment.—The *banking system* has fairly or foully *banked out* every species of industry—but *shaving;* and even that has become a *monopoly.*

The blessings of a bank of 35,000,000 are now felt along with the kindred *forty banks;* the *sheriffs* in all parts of the state owe gratitude to the authors of the banks.

It is calculated that three parts out of seven of the farms in the neighborhood of banks in this state—go through the *sheriff's mill.*

Mr *Quincey* said power travels westward; the banks of this state have swelled the stream of emigration enormously; those *farmers* who *exchanged* their *lands for paper,* and paid the paper in discounts—*travel westward fast.*

The *National Intelligencer* observes—We published without remark, a day or two ago, a circular from the bank of the United States announcing the determination, after that day, to refuse to receive the notes of any of its branches. A circular, issued by the branch at New York, and just come to hand, developes another feature of a system, the annunciation of which has greatly surprised, and will probably considerably agitate the community. If the objects of this measure, the first effect of which is to produce inconvenience, and generate distrust, were explained as publicly as the fact is known, such an exposition would have a tendency to tranquilize the public mind. If the *necessity* of it be shewn, the good sense of the community will cheerfully acquiesce in it, whatever temporary inconvenience it may produce. But, we cannot but think, the necessity must be strong, to justify a step which has immediately placed the paper of the bank, and of all its branches, at a discount proportioned to the distance from the place at which it is payable; for, as far as we have heard, the state banks have promptly followed the example set by the United States bank, of discrediting the paper of its own branches. Without, however, attempting any thing like a decision on the necessity or justice of this proceeding, we should be pleased to see the grounds of it explained.

"SHAVE YOU FOR A PENNY—WALK IN GENTLEMEN!"

RATES OF SHAVING! The *National Intelligencer* of a subsequent date, says—

It has been supposed, that the determination of the bank of the United States to refuse to receive its own notes and those of its branches in payment or on deposit, except at the bank or branches from which they issued, would have the effect to reduce below par all the paper of all the branches except in the places at which it issued. Perhaps, however, a more recent measure of the bank (of the branch at Washington, at least) may have the beneficial effect of counteracting that tendency. It is understood that the bank has established a tariff of *premiums* for which it will give *drafts* on distant banks, which, for this city, is reported to be as follows.

For drafts on	Baltimore,		½ per cent.
For	do.	Philadelphia,	1
For	do.	New-York	1½
For	do.	Boston,	2
Highest for drafts on *any* place,			2½

It is presumed, that the effect of this arrangement, which is supposed to be as general as that lately announced, will be, to give to the notes of the banks of the above cities circulating here, and, vice versa, to ours circulating there, a higher value than they could otherwise have, and thus in a degree to equilibriate the value of bank paper, along the maritime border at least. The premium is supposed to be equivalent to the cost of transportation of specie from place to place, which operation, and that of importing specie, is said to have cost the bank of the United States, since its establishment, no less a sum than three hundred thousand dollars.

[These rates are very *moderate*—the profit on the money occupied, (if industriously used) may not exceed *one hundred per cent. per annum!*—more of this hereafter.]

☞As almost every newspaper that we have seen contains an original or selected article expressive of indignation at the procedure of the U. States bank in discrediting its own notes *(like an abandoned mother proclaiming the bastardy of her own children,)* we feel it an act of common justice to insert the two following vindicatory notices—

From the Boston Patriot.

It appears by the circular of the U. S. bank that the idea of equalizing exchanges throughout our extensive country is absconded.—But it ought not to be forgotten that the evils we suffered from a vitiated currency, prior to the establishment of this bank, have been in a great measure removed, and that the business of exchange has been placed on the reasonable footing of fair commercial intercourse, with which we certainly should be satisfied. If bank paper is made to represent and command real capital, through the medium of specie, and exchanges are guarded from excessive fluctuation, being regulated by the just standard of the actual expense of transferring capital; every thing that was to be expected or desired from the bank, in the establishment of a just circulating medium, has been accomplished.

The doctrine of equalizing exchanges may now be laid aside as impracticable: no attempt, upon a scale equally extended, has, it is believed, been heretofore made; and a measure like the present, which was the nearest approach of the former U. S. bank, was found burthensome to that institution.

[If banks were what they were a few years ago, the exchange would equalize itself. There was very little, if any, shaving of bank notes *seven* years ago. When I established the WEEKLY REGISTER in 1811, there was not one bank note in twenty that I received which I could not pass off as money—now at least two thirds of those received cannot be passed for money. It is the extension of the manufactory of rags *(and nothing else)* that has brought about the present scandalous, *swindling* state of the currency.]

From the Washington City Gazette.

Why this clamor against the managers of the United States bank? They received the plan of their bank from the government; the subscribers consented to pay a large bonus and bought their charter, and certainly had profit in view when they purchased their exclusive privileges. Why this complaint that the branches do not take the notes of

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Kentucky, though classed in the list of directors, never sought that station, possessed no stock in that bank, and the first he heard of his being in nomination, was a letter announcing his appointment, and that *stock had been appropriated by somebody*, in order to qualify him; and further, that the moment of the receipt of the appointment, it was declined!!!

EDITOR AURORA.

each other? Suppose a branch bank be compelled to suspend specie payments? It is incumbent, therefore, upon the U. S. bank to prevent such a misfortune, and it can only act as it does. If the community be disappointed in its expectations, the bank is not censurable. If republicans establish what Burke terms the *despotism of fictitious capital to enchain arts, science, and industry,* the bank managers are not culpable.—It was evident, from the first, that the bank could not afford a remedy for the evils complained of. Fortunately, the clause which was introduced that the president should have the power of suspending specie payments was struck out, and one inserted in its stead, whereby the government may establish an uniform national currency without violating the charter. It is the lot of short-sighted man to become right by error; and no doubt the good sense of our legislators will ultimately rectify the evils which have occasioned such general murmurs, or rather outcries.

TURGOT.

☞The preceding were intended for last week's REGISTER. Since then, we observe several numbers of a series of essays publishing in the *Franklin Gazette*, at Philadelphia, broadly justifying the proceeding of the bank, from which we extract the following:

"To provide for demands, it is certainly essential that the United States bank know where they *can* be made; and to what amount—otherwise there could be no certain provision made to meet them. Then, suppose notes to the amount of a million of dollars to be issued at Philadelphia, payable at the branch bank in Washington:—it follows that means must be provided and placed in the Washington bank to meet that amount. The receivers of those notes take them with the "*promise*" expressed on the face of them, which is "*to pay at the branch bank at Washington.*"—But, instead of those notes being presented where they are made payable, and *where provision has been made to redeem them,* the holders stop at Baltimore, and demand of the branch *there,* payment for said notes. If the system be to redeem notes at branches where they are *not* made payable, then it is manifest that every branch must, *to be safe,* be provided with funds over and above the amount for which it is made accountable (and the mother bank too) in a sum embracing the issues made payable at *all* the branches, and at the mother bank also—or be compelled to draw divers ways, or to transport the means commensurate with such demand. In all which there is neither *system* nor *safety.*

"Suppose a million of dollars to be issued in Philadelphia, payable at a half a dozen of the branches, which would amount to six millions—and suppose the current of trade should bring those six millions, or even two of them, to the counter of the branch bank at Baltimore, where provision had been made to redeem the one million made payable there, does it not appear that a good deal of confusion, and toil, and risk, must arise out of such a case? But if the million made payable at Baltimore be presented there, corresponding means having been provided, all this confusion, and toil, and risk, vanishes; and order and system take their place.

"It is entirely clear, therefore, that the bank in Philadelphia *cannot,* consistently with its obligation to its interests, hold itself liable to receive and pay those notes which have, or may be issued, and made payable elsewhere—because, wherever the notes are promised to be paid, means, it is presumed, are provided to redeem them. This applies to the branches equally in their relation to each other; and in their relation to the mother bank."

Now "suppose" we take the whole of this *in extenso,* and in the plain, sober, honest meaning of the words in which it is given to us—admitting that there is no sort of twisting or turning about the matter,—we may well ask, "*and what of that?*"—Were the directors of the bank of the United States such *stupid ninnies* as not to know that the effects *supposed* as possible to take place now, might easily take place? It cannot be believed that they were silly enough not to have apprehended it—why then so *rapidly* multiply their branches, as if it were to bring about the very thing that is offered in excuse for them? Pshaw!—the excuse is urged like a foundered and broken-winded horse moves forward!! But, "suppose" the excuse is a good one—what is offered to justify the *impudence* of its operation, or to quiet the feelings of the people for injuries received, by the *secret and sudden forfeiture of the faith on which they received the notes of the bank of the United States?* I myself, the other day, had more than one hundred dollars in small notes of the bank of the United States in my pocket, and could not pay the *postage* of a few letters—they have also been refused at our wharves for *wood!* But since Mr. Barker's publication in New York, they have partially retrieved their credit, and are getting better in Baltimore, because the balance of trade, between the two cities, is in favor of New York.

Let the advocates of the bank, or of the speculators in its stock, say what they will—the root of the matter, and the whole cause of every wayward proceeding of this bank, lies simply here—that the stock was not paid for as it was expected to have been; and that the body of it (nine tenths, probably) is in the hands of speculators and money-changers, whose conduct has been such as to drive many real capitalists from the institution, though some such yet remain in it.

The enormous stock notes, it appears, have not been curtailed as other men's notes are—and hence the pressure on the many for the benefit of a few.

Foreign Articles.

ENGLAND, &c.

American flour, at Liverpool, 43 to 44s. per bbl.

The London Sun of the 13th Aug. notices the improved health of the queen. The manufactures at Manchester still remained "refractory."

A Liverpool paper of the 14th of August, says, that there is every reason to believe that the cause of the return of the duke of Wellington to this country at present, is the total failure of all attemps to effect an amicable adjustment of the subsisting differences between Spain and Portugal: the latter being resolute in its refusal to relinquish possession of Monte Video. In this state of things, our government feels itself in a very serious state of embarrassment.

Greenock papers mention a *portable* mill, with which one man can grind 4 or 5 bushels of wheat per day.

The national debt of England amounted on the 1st February 1817, to 819,536,937 pounds sterling.

FRANCE.

M. Monge, one of the greatest geometricians of the age, died lately in Paris, aged 70 years. He was a distinguished member of the French insti-

tute, and one of the men of science who accompanied Bonaparte on his expedition to Egypt.

It is believed that Soult and other important exiles will soon be recalled.

Heat. A Paris paper of the 9th of August, in noticing the unusual heat of the weather, thus remarks—"The excessive heats that we experience have given rise to several meteorological observations, sufficientiy interesting. A remarkable circumstance in them is, that the heats are nearly equal throughout Europe, in all latitudes. At Rome, Berlin, Madrid, and Vienna, the thermometers of Reaumur have risen to the same degrees.

SPAIN.

Letters from Madrid (says a London paper) to the 16th of July mention, that a change in the war department was soon expected, and that an expedition of about 3000 troops were preparing to sail for Havanna. The same letters announce, that king *Charles* the 4th is preparing to present to the approaching congress at Aix la Chapelle, a claim to the throne of Spain; and that he has a strong party in his favor at Madrid.

The French papers say, that a convoy of 14 Spanish ships, which sailed from Cadiz the 24th June, were nearly all captured on the evening of the 25th, by the insurgent privateers which cruize off Cape St. Vincent. It is added, that the crews were put on board a chasse maree which formed part of the convoy, and were all disembarked near Vigo.

Don Whiskerandos. A private letter from Irun, in Spain, is published in one of the London papers as follows:—

"During the incertitude of the government to the hostile disposition which the U. S. have unceasingly manifested towards Spain, it appears certain that the fine squadron which is equipping in the port of Cadiz (composed of the ships ceded to us by Russia, and such of our own as have escaped destruction) will not set sail for S. America until the government can determine the footing of our relations with N. America. This squadron consists of 8 ships of the line, several large frigates, and a proportioned number of corvettes—the crews are complete. This force is almost wholly armed and equipped, and commanded by the best naval officers of the country."

[Who is not frightened at this? Is not the capture of our little squadron in the Mediterranean to be feared, from the *indignation* of Spain?! Suppose this mighty fleet of eight sail of the line and several large frigates—all with "crews complete," were suddenly to pounce upon the Franklin—would the Franklin capture more than half a dozen of them? But there is some *hope* that *Ferdinand's* great fleet may be blockaded by the two or three "*pickaninnee*" patriot privateers that now seal up her chief port *Cadiz!*]

GERMANY.

The London paper give a vague rumor of an attempt to murder young Napoleon, when the child was in his bed. "If it is true, we shall hear more of it."

The duke of Kent, on entering the town of Bischossgeim, on the frontier of Lemingen, was preceded by all the young girls in the village, dressed in white and decorated with ribbons, strewing garlands of roses before his carriage, *for his condescention in passing through their little village.*

[The earth is much indebted to this mighty *Guelph* for the honor he does it in "condescending" to inhabit it.]

The people of Germany bordering on France, are said to sigh rather for the active reign of Napoleon than to be pleased with the silent despotism which at present prevails. His sway, except for military puposes, was mild compared with that of their new masters.

A Vienna Gazette says—There has been spread in our city, with astonishing rapidity, for some days, a pamphlet on the subject of manufactures and commerce, which excites general interest. It was originally printed at Frankfort, on Maine, and is entitled, "An essay on the question, How may the nations of Germany shake off the yoke of England?" The author says, that it is impossible to deny the real existence of this servitude, as much longer to remain blind to its consequences; which, according to him, are approaching to the total destruction of our commerce. The same opinion is expressed in a pamphlet published at Vienna, entitled, "Is the decay of the manufacturers of Austria worthy of the attention of government?" This piece is attributed to the pen of count Kuessfein, who has already produced several works of acknowledged merit.

The official Gazette of Vienna contains a circular from the government announcing for sale by public auction, twenty-eight estates belonging to the crown, in order to apply the profits to the payment of the national debt. Some of these estates are of very great extent, with 9000 or 10,000. inhabitants.

BRITISH AMERICA.

Mr. Gourlay has been again arraigned for a libel and acquitted in Upper Canada. On both occasions he plead his own cause.

Halifax, July 31.—The right rev. Edmund Burke Catholic bishop of Nova Scotia, arrived here on Wednesday last, overland, from Quebec—a distance of 636 miles, including rivers, &c. in 21 days.

FLORIDA.

It is rumored that the Seminoles and other Indians, scattered by gen. Jackson, have collected together in East Florida, and threaten to be troublesome.

It is said that the Spanish minister has intimated to our government, that the late grants to individuals of land in East Florida, will be vitiated on a transfer of that province by Spain to the United States.

Pensacola, &c.—An article has appeared in the *Georgia Journal*, on the subject of the restoration of Pensacola, &c. which states the following as authentic:—

1*st.* That Pensacola *will be delivered up, whenever a Spanish accredited agent appears to receive and receipt for the restoration.*

2*d.* That *afterwards*, Spain will be required to comply with her treaty obligations to maintain such a force as will keep the Indians at peace. If she refuses, or neglects, then *congress* will determine on the expediency of occupying and holding the whole or any part of Florida, and doing any *other* ACT OF WAR. And

3*d.* That *St. Marks*, being a military post situated in an immense wilderness, and surrounded by hostile Indians, *will not be restored* until Spain shall sufficiently garrison it, and cause her authority to be respected in that quarter.

☞We sometime ago preferred a request to the editor of the *Savannah Republican*, that he would favor us with a copy of the trial of Arbuthnot and Ambrister, on which Mr. Fell observes——"We would with pleasure gratify our friend Niles, by publishing the proceedings of the trial of Arbuthnot and Ambrister; but the gentleman who was so kind as to loan it to us particularly requested that it should not be published.—Besides, the

manuscript copy of the trial which we had is not now in our possession. It was only shewn us to convince us of the justice of the execution of the two men alluded to. We suspect that these documents will not be made public before the meeting of congress. They contain circumstances very interesting to the people, but we are decidedly of opinion that they should not be ushered to the world at the present time."

It is pretty positively stated that 800 indians and negroes are encamped near the Musquetoe, and another body of about 1000 on the St. John's river. They avow themselves to be hostile and are only waiting supplies to commence their operations—it is believed they have partially obtained ammunition from St. Augustine,

Capt. *Obed Wright* is reported to be at Augustine—where he had obtained a Spanish protection, intending to proceed to Havanna.

A few white persons have lately been murdered on the Georgia frontier—we hope, however, that there will soon be an end of these things.

SOUTH AMERICA.

Several gentlemen charged with being concerned in the fitting out of a patriot privateer at Baltimore, have been arrested, and given bail to appear at the next court competent to examine the alleged offence.

A Portuguese ship of 1000 tons, deeply laden, a part of her cargo being a million of pounds of sugar, has arrived off the mouth of the Patapsco river, but must be lightened before she can get up to Baltimore. She is armed with 18 or 20 guns, and reported as a prize to a patriot privateer under Artigas' flag, in distress—is in charge of a revenue officer, and claimed by the Portuguese consul.

We have accounts from *Buenos Ayres* to the 27th of June. The papers give us full details of several affairs that took place after the battle of Maipu, by which it appears that that splendid victory was *completed* by the capture of the remnant of the royal army. Since these events, the viceroy of Peru has agreed to a *previous* proposition of the patriots to adop the rules of civilized warfare by an exchange of prisoners, &c. These facts are officially stated—and the term *"rebel"* we suppose, will not be so frequently used in South America as heretofore. Capt. *Biddle* appears to have taken a friendly part towards bringing about the humane arrangement.

Judge Bland, (says the *Maryland Censor*) as commissioner from the American government, had arrived, we are glad to learn, in good health, at St. Jago, in Chili. A severe engagement took place on the 27th of April, between the Lautaro, an English East Indiaman, fitted out at Valparaiso, and the Spanish frigate Venganza. The captain of the Lautaro threw himself, with 25 men, on board of the Spanish frigate, to whom she struck; but unfortunately the Lautaro fell off and these brave men being unable to hold her in subjection, the frigate, with a brig in company, made their escape. The gallant commander of the patriot ship, George O'Brien, died (probably massacred) on board the Venganza.

By the Buenos Ayrean privateer Invincible, (says the Baltimore Patriot) letters have been received in this city, under the date of the 6th July, from that place, mentioning that the viceroy of Peru has proposed an armistice for a year, with an offer of withdrawing the royal troops from Potesi, Charcas, la Paz, and Cochabamba, to the Desaguadero, the former frontier of La Plata; but on condition from the patriots not to molest the royalists, who are yet in the province of Talcaguana in Chili. General San Martin was at Buenos Ayres. The cause of his being absent for so long a time from the army was not known, although it was rumored that he will succeed Puerrydon.

Another paragraph informs us that Artigas successfully maintains his war against the Portuguese on one side and the Buenos Ayreans on the other—he has recently defeated some troops of the latter.

In the Register of the 29th ult. page 9, we noticed the arrival of the patriot privateer Gen. San Martin, at Savannah—her crew being in a state of mutiny, were committed to jail. By order of the president of the United States, they have been taken into the custody of the marshal of the district.

BARBARY POWERS.

The London Globe of July 27, in speaking of the usual presents (gunpowder, cannon, cordage, &c.) which had just been sent from Stockholm to Algiers and Tunis, remarks:—"We lament to find the king of Sweden meanly truckling to the Barbary states and purchasing their forbearance by the customary presents exacted from him by these lawless depredators. The example of so many other nations of the continent, (Denmark excepted,) should have inspired him with a better spirit." [Why not refer to the example of *America*, which *shamed* England herself to fight Algiers, &c ?]

CHRONICLE.

The 12th of September, the anniversary of the battle near Baltimore, was honored in this city by military parades and civic feasts.—The managers of theatre gave the profits of the night's entertainment in aid of the city fund for the use of the widows and orphans of those who fell in its defence—the amount paid into the treasury was *three hundred and eighty-two dollars and fifty cents.*

The sea serpent is called the "great Boston hoax." But it is still insisted that the *horse mackarel* is not the animal said to have been so frequently seen off the coast; and fresh reports of his appearance are afloat.

The number of *emigrants* at present arriving, are believed to be nearly *four hundred* per day.

Gen. St. Clair. This venerable soldier of the revolution died near Greensburg, Penn. on the 31st ult. in the 84th year of his age. He was interred in the most respectful manner, with masonic and military honors. A sketch of his life, with an account of the proceedings at his interment, is laid off for record in this work.

Died at Plattsburgh, on the 28th ult. col. Melancton Smith, aged 38 years, late col. of the 29th regt. United States infantry, who valuably assisted in the defence of Plattsburgh in Sept. 1814.

Mail robbers.—We omitted to mention in our last, that *Joseph Thompson Hare* and *John Alexander*, convicted of robbing the United States mail, were executed at Baltimore by a warrant from the president of the United States, on Thursday the 10th instant.

Baptism, by immersion, was performed for the *first* time at New Orleans, on the 9th ult.

Vermont. Gov. Galusha has been re-elected in Vermont without opposition; the returns for congress are not yet received.

Pensions. The editors of the Intelligencer are authorised to state, for the information of those interested, that the number of applicants for pensions under the act of the last session, has been so great, that it has not been possible, with every exertion, to act upon them so fast as they came in.

In addition to which, some delay has taken place in order to supply from the records of the several states, the documents in relation to revolutionary services, which were destroyed when the war office was burnt in 1801; which cause of delay is now almost wholly removed.

The applications for pensions are taken up in the order of time in which they were received, and every effort will be made to render the delay as short as possible. When claims to pensions are admitted, the certificates will be transmitted to the persons by whom the claimants' papers were sent to the war department. When rejected, they will be returned in the same manner, with the reasons stated for rejection. Mere letters of general enquiry as to the state of particular applications, we are informed, cannot be answered, as it would consume much of the time that ought to be engaged in the investigation of claims.

Kaskaskia. The *first* steam boat arrived at Kaskaskia on the 10th ult. It was the Franklin, from New Orleans, in 18 days running, with a cargo of groceries, &c. her whole *freight* worth $8,500. Erie, on lake Erie, was in like manner *first* visited by a steam boat on the 21st ult. She has since returned to Black Rock, and will leave it every Wednesday for Cleveland and Detroit.

Gov. *Clinton*, invited by several societies, proposes to take an agricultural tour through New York.

A captive found.—Gov. Cass, of Michigan territory, advertises for the relatives of *John Taylor*, who has lately escaped from the Indians on Red River, near lake Winepee. It appears that in 1790, when he was about nine years old, he was stolen by the Indians from the banks of the Ohio, and has been with them ever since. He speaks no English. The whites pursued the Indians, and in a conflict, the chief, Black Fish, was killed; which it is thought will lead to a discovery.

Longevity. From the "Laurel" published at Mount Sterling, Ky. An extraordinary spectacle was exhibited at the polls, during the election, in this place, in the person of Mr. John Summers, *one hundred and twelve years of age*, who appeared and exercised the right of suffrage, having walked several miles for that purpose.—He was born the 12th July, 1706, in Virginia, and has been a resident of Kentucky about thirty years, and, we are informed, has resided in this county nearly the whole of that time. He has had 24 children, 14 now living, the youngest 11 years old; and has had upwards of 300 grand children. His hearing and sight are good.

Another case—From the "Watch Tower," published at Ballston, N. Y.—Died in June last, Mr. Alexander Ross, aged about *one hundred and twenty*. Mr. Ross was a native of Scotland, and served in the army of the *pretender*, in 1745. After his defeat and the consequent ruin of the army, Mr. Ross came to America, and served in the army of gen. Wolf, and was severely wounded on the Plains of Abraham.

On the breaking out of the revolutionary war, Mr. Ross, although very aged, took up arms in defence of our country, and distinguished himself by his bravery and soldier like conduct, in several severe actions He was a consistent patriot, a sincere and faithful friend—honesty and integrity marked his way, and contentment delighted in him.

Death of col. Daniel Boon.

As he lived so he died, with his gun in his hand. We are informed by a gentleman direct from Boon's settlement on the Missouri, that early in last month, col. Boon rode to a deer lick, seated himself within a blind raised to conceal him from the game. That while sitting thus concealed with his old trusty rifle in his hand, pointed towards the lick, the muzzle resting on a log, his face to the breech of his gun, his rifle cocked, his finger on the trigger, one eye shut, the other looking along the barrel; through the sights—in this position without struggle or motion, and of course without pain, he breathed out his last so gently, that when he was found next day by his friends, although stiff and cold, he looked as if alive, with his gun in his hand, just in the act of firing. It is not altogether certain, if a buck had come into the range of his gun, which had been the death of thousands, but it might have intuitively obeyed its old employer's mind and discharged itself. This hypothesis being novel, we leave the solution to the curious.

[*Chillicothe Supporter.*

ALABAMA LANDS.—In a conversation lately with a gentleman from the Mississippi, our ideas on the subject of the enormous prices for which the lands in the Alabama are said to have sold for, have been considerably changed. We always thought it somewhat suspicious that wild land there should bring 30 dollars an acre, when better land lying within 12 or 15 miles of Natchez could be purchased for from 10 to 20 dollars an acre, but it came in so imposing a shape that it scarcely could be doubted. However, we are now satisfied that in most of the instances it was a trick played off on the government in something like the following manner. Speculators previous to the sale, fixed upon the property they wished; they then employed agents to come forward and bid for it any price, this was done; in consequence of which the wildest offers were made—but when payment came to be demanded, the bidders had disappeared, and the property remained in the hands of government. The persons who had laid the plan then appeared, and agreed to take the land at *congress* price! This story comes from the most respectable authority.—*Pittsburgh Gaz.*

Town of Haywood, N. C.—At the sale which took place a few days ago at this new town on Cape Fear, the lots went off at prices beyond all previous calculation. Some of them, which contain less than half an acre, being only 100 feet in front and 200 feet deep, sold as high as $1350. A lot, which in the original sale, was purchased for a few dollars over 50, was on this occasion, sold for the highest price above mentioned. *Raleigh Reg.*

The Pamunkey Tribe of Indians, (in Virginia,) which was one of the confederacy of Powhatan, was reduced to 10 or 12 men, when Jefferson wrote his notes; but it has since increased, so that it now consists of near 200 persons; but most of them have more Negro than Indian blood in them. The present chief is a member of the Baptist church.—Two brothers of the name of Bradberry, have lately married into the tribe, and settled among them; but a meeting has been called to see whether they will permit them to stay. The elder B. is said to be worth several thousand dollars.

Important discovery.—Mr. *Sickney*, an Indian agent at fort Wayne, states that he has lately discovered that "there is an uninterrupted navigation from Lake Erie to the Rivers; and also from Lake Michigan to the Mississippi, by the Auplain river, which throws part of its waters into the Lake, and part into Illinois river. *Com. Ad.*

Buffalo, Sept. 1.—A number of the Stockbridge tribe of Indians passed thro' this place last week, with their families, on their way to White river, Indiana, where they own a fine tract of land, on which several of their tribe had already settled.